CLAIMS

1. A method of producing hybrid proteins from a hybrid gene cDNA library comprising:

providing a purified sample of a vector comprising a DNA molecule having at least one selectable marker sequence and a sequence encoding a hybrid protein region, wherein the hybrid protein region comprises:

a regulatable DNA sequence;

a multiple cloning site immediately 3' to the regulatable DNA sequence, wherein the multiple cloning site does not encode a translational termination sequence; and

a DNA sequence encoding at least one common peptide placed 3' to the multiple cloning site, wherein the common peptide encoding sequence does not contain a translation initiation codon;

isolating a mRNA template population of interest;

synthesizing a cDNA population from the mRNA template population using random sequence oligonucleotide primers;

adding cloning linkers to the cDNA population;

cleaving the vectors at the multiple cloning site;

inserting the cDNA population molecules into the cleaved vectors, to create a hybrid gene cDNA library;

transforming bacterial cells with the hybrid gene cDNA library and selecting transformed cells;

purifying the hybrid gene cDNA library from the transformed bacterial cells;

transforming yeast cells with the hybrid gene cDNA library and selecting transformed cells; and

allowing transformed yeast cells to produce a hybrid protein.

2. The method of claim 1, wherein the bacterial cells transformed with the hybrid gene cDNA library are *E. coli* cells.

3. The method of claim 1, wherein the vector encodes a common peptide sequence comprising six successive histidine residues and the hybrid protein is purified from the yeast cells using affinity purification.

4. The method of Claim 1, wherein the hybrid protein region further comprises a transcription termination sequence placed immediately 3' to the common peptide encoding sequence.

5. A hybrid protein production method comprising:

isolating an mRNA template population;

synthesizing a cDNA population from the mRNA template population using random sequence oligonucleotide primers;

cleaving vectors at a multiple cloning site;

inserting members of the cDNA population into the cleaved vectors, to create a hybrid gene cDNA library; and

expressing a hybrid protein from the hybrid gene cDNA library.

6. The method of Claim 5, wherein the vectors further comprise a DNA molecule having at least one selectable marker sequence and a hybrid protein region sequence.

7. The method of Claim 6, wherein the hybrid protein region sequence further comprises:

a regulatable DNA sequence;

a multiple cloning site lacking a translation termination sequence placed immediately 3' to the regulatable DNA sequence; and

at least one common peptide encoding sequence lacking a translation initiation codon placed 3' to the multiple cloning site.

8. The method of Claim 7, wherein the hybrid protein region sequence further comprises a transcription termination sequence placed immediately 3' to the common peptide encoding sequence.

9. The method of Claim 5, further comprising:

transforming bacterial cells with the hybrid gene cDNA library and selecting transformed cells;

purifying the hybrid gene cDNA library from the transformed bacterial cells;

transforming yeast cells with the hybrid gene cDNA library and selecting transformed cells; and

expressing the hybrid protein in the transformed yeast cells.

10. The method of Claim 9, wherein the bacterial cells comprise *E.coli*.

11. The method of Claim 5, wherein the vectors encode a common peptide sequence having six successive histidine residues and further comprising purifying the hybrid protein using affinity purification.

12. A hybrid protein production method comprising:

isolating an mRNA template population;

synthesizing a cDNA population from the mRNA template population;

cleaving vectors at a multiple cloning site, wherein the vectors include a DNA molecule having at least one selectable marker sequence and a hybrid protein region sequence including:

a regulatable DNA sequence;

a multiple cloning site lacking a translation termination sequence placed immediately 3' to the regulatable DNA sequence; and

at least one common peptide encoding sequence lacking a translation initiation codon placed 3' to the multiple cloning site;

inserting members of the cDNA population into the cleaved vectors, to create a hybrid gene cDNA library; and

expressing a hybrid protein from the hybrid gene cDNA library.

13. The method of Claim 12, wherein synthesizing the cDNA population comprising using random sequence oligonucleotide primers.

14. The method of Claim 12, wherein the hybrid protein region sequence further comprises a transcription termination sequence placed immediately 3' to the common peptide encoding sequence.

15. The method of Claim 12, further comprising:

transforming bacterial cells with the hybrid gene cDNA library and selecting transformed cells;

purifying the hybrid gene cDNA library from the transformed bacterial cells;

transforming yeast cells with the hybrid gene cDNA library and selecting transformed cells; and

expressing the hybrid protein in the transformed yeast cells.

16. The method of Claim 15, wherein the bacterial cells comprise *E.coli*.

17. The method of Claim 12, wherein the vector encodes a common peptide sequence having six successive histidine residues and further comprising purifying the hybrid protein using affinity purification.